Bay Area Air Quality Management District
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San Francisco, CA 94109

Staff Report

September 2002

Proposed Amendments to BAAQMD Regulation 8, Rule 16: Solvent Cleaning Operations

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Executive Summary

Regulation 8, Rule 16 was originally adopted in 1979 and reduces volatile organic compound (VOC) emissions from the cleaning of metal parts and products. The rule establishes equipment and operation standards for cleaning equipment. The other major air districts in California have similar rules.

This proposal amends the rule to incorporate improvements in technology and clarify existing language. Proposed amendments to Regulation 8, Rule 16: Solvent Cleaning Operations will become effective June 1, 2003. These amendments will eliminate cold cleaners using organic solvent in targeted industries, and require the use of aqueous solutions containing not more than 50 grams/liter of organic solvent.

The proposed amendments are expected to result in an emission reduction of approximately 2.2 tons per day at a cost to industry of approximately $1,337,000 per year. The cost effectiveness is estimated to be $1,664 per ton of emissions reduced.

Proposed amendments affecting “repair and maintenance” cleaning, by far the largest user of cold cleaners, were discussed at one BAAQMD workshop and one dinner meeting with the Automotive Service Council. The proposed amendments are intended to minimize the economic impacts of the rule while achieving emission reductions. Pursuant to the California Environmental Quality Act (Public Resources Code Section 21000 et seq.), the District’s CEQA consultant, Jones & Stokes, has conducted an initial study for the proposed amendments. Based on this study, Staff recommends adoption of a negative declaration for this rulemaking.

Introduction

The Bay Area Air Quality Management District’s 2001 Bay Area Ozone Attainment Plan[1] outlines control measures designed to attain national ambient air quality standards for ozone in the Bay Area. Ground level ozone is formed when sunlight acts on volatile organic compounds and nitrogen oxides emitted into the atmosphere. Most of these emissions come from mobile sources like

cars and trucks and stationary sources having a single emission point such as a "smoke stack." Volatile Organic Compound (VOC) emissions from stationary sources contribute to the formation of smog in the atmosphere. VOCs react photochemically with oxides of nitrogen to form ozone, a criteria pollutant. Ozone is a strong oxidizer that irritates human tissue and damages plant life.

Regulation 8, Rule 16: Solvent Cleaning Operations, was originally adopted on March 7, 1979 and reduces emissions from solvent cleaning operations using cold, vapor and conveyorized solvent cleaners. Cleaning operations are widespread throughout the manufacturing industries. For most surface coating operations, organic solvents are used to remove uncured coatings, inks and adhesives, and to maintain application equipment, spray booths, and other materials used in the coating process. In order to remove contaminants such as dust, oils, etc., solvents may be used for preparing the substrate prior to coating, usually by wipe cleaning. Solvents are also used in repair and maintenance operations such as machine shops and automotive repair shops to remove grease and contaminants from tools and/or automotive parts.

In the 2001 Bay Area Ozone Attainment Plan, Control Measure SS-14[2], Aqueous (Water-Based) Solvents, was developed in order to reduce emissions of VOCs by the use of low VOC aqueous cleaners. Traditional solvents have been petroleum-based organic compounds, such as mineral spirits, that volatilize completely into the atmosphere and are precursors to ozone formation. Switchover to alternative solvents in appropriate cleaning applications will result in a reduction in VOC emissions. The alternatives currently available are methylated siloxanes (low volatility compounds with negligible volatility and no known significant toxicity) and water-based solvents.

Background

Regulation 8, Rule 16, Solvent Cleaning Operations, contains specific operating requirements for solvent cleaning equipment such as vapor solvent cleaners, conveyorized degreasers, and cold cleaners. It sets equipment standards and operating requirements that reduce solvent emissions. The rule is based on the standards described in the United States Environmental Protection Agency's (EPA) 1977 guidance, "Control of Volatile Organic Emissions from Solvent Metal Cleaning"[3] and the California Air Resources Board's (ARB) 1991 document, "Organic Solvent Cleaning and Solvent Cleaning Operations."[4]

The first amendment to the rule occurred in 1989. The amendments primarily served to correct deficiencies identified by the EPA during the post-1987 State Implementation Plan review.

Subsequently, in 1998, the rule was amended to incorporate the following:

- Each facility was allowed a single organic solvent cold cleaner with a maximum solvent usage limit of 20 gallons per year. Any additional cleaners in a facility were required to:
    - Use an aqueous solution containing not more than 50 g/l VOC; or
    - Be permitted as an emission source by the District as per Regulation 2, Rule 1: Permits. Regulation 2, Rule 1 was also amended to require permits for multiple cold cleaners in a facility.
- Solvent cleaners using halogenated solvents are also subject to the National Emission Standards for Hazardous Air Pollutants (NESHAP). Language was added to reference the federal rule.
- New language was added to the rule to clarify applicability of the rule to new types of solvent cleaners. Enclosed cleaners (closed-loop), solvent vapor dryers (IPA dryers) and spray gun cleaners are examples of these cleaners.
- New language was added to clarify the applicability of the rule to include only solvent cleaning equipment.
- The rule was renumbered. Out-dated sections such as administrative requirements were dropped. Definitions were alphabetized.

The 1998 amendments were based in part on South Coast AQMD Rule 1171[5]. At that time, the South Coast rule included exemptions from its general cleaning standard that allowed facilities that perform repair and maintenance cleaning to have an organic solvent cold cleaner. In addition, the BAAQMD experienced difficulty enforcing restrictions on parts allowed to be cleaned using organic solvents. Therefore, the 1998 amendments exempted one solvent cleaner per facility from the 50-gram-per-liter standard, but required all other cleaners to either meet the standard or to have a permit. At that time, the BAAQMD and other districts did not require permits for the small remote-reservoir cold cleaner typically found in shops which perform repair and maintenance cleaning. In practical effect, the SCAQMD rule in 1998 and the BAAQMD's 1998 amendments to Regulation 8-16 were similar.

The 1998 amendments forced operators to look at their cleaning processes. Due to the permit exemption for one organic solvent cold cleaner, some operators partitioned cleaning activities into aqueous and organic solvents to avoid the permit process. Others chose to continue using their organic solvent cold cleaners and applied for permits for their solvent cold cleaners. The automotive repair industry accounted for most of these permits.

On April 19, 2001, the San Joaquin Valley Unified APCD adopted a rule[6] with a 50-gram-per-liter standard, with more limited exemptions than those found in the SCAQMD rule and without the specialty cleaning categories. Because many types of industry found in the SCAQMD and Bay Area are not found in the San Joaquin Valley, the SJVUAPCD rule does not include provisions for specialty

cleaning that are found in the SCAQMD rule and are likely to be necessary in the Bay Area.

The proposal amends the BAAQMD rule to require all cold cleaners used in repair and maintenance cleaning to meet the 50-gram-per-liter standard. This standard has been successfully applied in SCAQMD. In 2002, Safety Kleen, a major supplier of cold cleaners for these facilities, successfully converted approximately 30,000 mineral spirits parts cleaners in the Los Angeles area to aqueous cleaners. Safety Kleen has demonstrated that the use of aqueous cleaners in southern California is technologically feasible and cost-effective.

A typical repair and maintenance facility has one cold cleaner (parts washer), a 20-gallon unit on a six-week solvent change-out cycle. These units are typically described as a “sink on a drum". The solvent is stored in the drum (enclosure reservoir). Parts are placed in the sink area and solvent is pumped over the part. The solvent then drains back into the drum. Mineral spirits, a low vapor pressure organic solvent, is the preferred cleaner. Oils and grease are the typical soils that are removed. The operator leases the parts washer from the supplier, who maintains and repairs the cleaner and recycles the solvent.

Bus maintenance terminals, fleet vehicle maintenance centers, and truck stop facilities use larger parts washers (typically 35 gallon units). These facilities usually have more than one parts washer. The larger units are immersion sinks, a rectangular cabinet with the solvent covering the bottom of the tank. A tray holds the part and the solvent is pumped over the part, draining to the tank bottom. The larger units may have filters and oil skimmers to prolong the life of the bath. Similar to the smaller cold cleaners, the operator leases the parts washer from the supplier, who maintains and repairs the cleaner and recycles the solvent.

Aqueous Cleaning Technology

The Institute for Research and Technical Assistance (IRTA) with funding from the U.S. Environmental Protection Agency’s Environmental Justice Pollution Prevention Program conducted a developmental study of water-based cleaners as alternatives to mineral spirits in auto repair facilities in 1995 and 1996.[7] The demonstration project involved testing water-based cleaners in 18 auto repair facilities to determine their feasibility and to optimize their conditions of use. The results of the study indicated that water-based cleaners were a viable alternative to mineral spirits.

There are four generic types of cleaning systems available for use with water-based cleaners. Each of these is described briefly below[8].

- **Sink-on-a-Drum Parts Washer**

This unit consists of a sink mounted on a drum that has a fluid capacity ranging from about 15 to 40 gallons. It contains a heater, a pump, a faucet and brush applicator.

- **Enzyme System**
  Enzyme systems are generally modified sink-on-a-drum units and are commonly made of plastic. They contain a specifically formulated surfactant-based emulsifying neutral enzyme cleaner. Microbes are added to the system either in an impregnated filter or directly into the cleaning formulation. The cleaner emulsifies the oil and grease and the microbes break down the contaminants into carbon dioxide and water. Like the sink-on-a-drum unit, the enzyme system has a heater and a pump. Units generally have a 15 to 30 gallon liquid capacity.

- **Immersion Parts Washer**
  The difference between this unit and a sink-on-a-drum is that the immersion system has a false sink that can be removed and a reservoir that is accessible for cleaning or soaking. The unit also contains a heater and a pump and has a liquid capacity of 30 to 60 gallons. Again, it can be constructed of metal or plastic.

- **Spray Cabinet**
  This type of unit operates by spraying and/or flushing high pressure cleaning formulation in an enclosed cabinet. The parts are placed inside the cabinet, generally on a platform, and the door is closed. The spray nozzles are positioned to target specific areas of the parts. The mechanical action provided by the worker for the other units is automated in the case of the spray. Spray cabinets are made of metal and some have plastic tops. They can be classified as top or front loaders. The liquid capacity of the smaller units for use in this sector ranges from 20 to 100 gallons. These units are generally heated to a higher temperature than the other types of units because workers' hands do not come in contact with the fluid.

In 1995 when IRTA performed the developmental study, there were very few vendors that offered aqueous cleaning formulations, equipment or systems. By 1998, numerous vendors had begun offering new products using water-based cleaning. IRTA conducted case studies in Southern California that represent a range of repair and maintenance cleaning needs at different maintenance and repair facilities.[9] As part of the project, IRTA performed cost analyses that compared the costs to each facility of using mineral spirits systems and the cost of using water-based systems. In all cases but one, the cost to the facility using the water-based cleaning system is lower than the cost of using the mineral spirits system. In some instances, the reason the cost is lower is that the water-based cleaners require change out less frequently than the mineral spirits. In other instances, where the facilities have purchased spray cabinets or ultrasonic

units, the cost is often dramatically lower because of the labor savings from the use of the automated systems. In one instance where the cost of the water-based system was higher, the facility converted to a much better cleaning unit. In addition, the facility (an auto repair facility) is now able to use the cleaning unit for parts and brake cleaning and can avoid the purchase of aerosol brake cleaners.

The City and County of San Francisco, Hazardous Waste Management Program, under the Aqueous Cleaning Demonstration Project, demonstrated aqueous cleaning in selected City department facilities to determine the viability of replacing solvent cleaning with aqueous cleaning. Between February 1988 and January 1999, 14 different aqueous cleaning units were demonstrated at three Municipal Railway (MUNI) fleet maintenance facilities. The results of the demonstration project indicate that aqueous cleaning is a viable and cost-effective option for the City's department facilities.[10]

Alternatives to Aqueous Cleaners

Based on comments received at the workshop, staff propose alternatives to the 50 g/l standard for cold cleaners in Section 8-16-303.5. The first alternative is the use of an abatement device to control emissions by at least 90%. This is a standard alternative that is useful for facilities that have significant emissions and that clean and paint in abated environments, such as at NUMMI.

The second option is to use cold cleaners containing branched, cyclic or linear, completely methylated siloxanes. These compounds, termed VMS (volatile methyl siloxanes) were determined to have a negligible contribution to photochemical reactivity by the US EPA and exempted from their definition of VOC.[11] The ozone chamber studies show that VMS actually reduce ozone, that is, they have a negative reactivity. The mechanism of the degradation products is not fully understood, however, so a reactivity of 0 is assigned for the purposes of the California Consumer Products regulation.[12] VMS have not been determined to be toxic by either the US EPA or the California Office of Environmental Health Hazard Assessment. They also have no odor and no upper stratospheric ozone depletion potential. Nor are they likely to contribute significantly to global warming compared to other organic compounds that have a higher level of carbon to convert to CO2. VMS are widely used in consumer products; some evaporate readily but many isomers have a low evaporation rate.[13] No impacts on the aquatic environment have been identified from possible releases of VMS from consumer applications. Staff conducted an environmental impact analysis for VMS in District surface coating rules in November 1995 and the Board adopted amendments exempting VMS from those rules.

Staff do not recommend exempting any VOC from Regulation 8, Rule 16. Rule 16 regulates containerized solvent cleaning. Exemption from the rule would allow solvents to be stored in open containers or handled in a manner that ignores simple housekeeping steps and could produce significant emissions. Most solvents that the EPA has exempted, like acetone, produce some ozone. At high evaporation rates they have the potential to produce more ozone than some non-exempt but less evaporative solvents.

Instead of an exemption, the proposed amendments allow the use of siloxanes in specific situations. Housekeeping requirements still apply. The user still has to store the solvent in closed containers, repair liquid leaks, keep usage records, and set parts so the solvent drains back into the container. There are several Bay Area facilities that have invested in VMS parts washers with enclosed washing systems to minimize the evaporation of the VMS. Staff have evaluated these units and find them an acceptable alternative to aqueous solvents because the VOC emissions are equivalent, and there are no known environmental consequences of VMS use.

Emissions Subject to Control

Currently, the District exempts one solvent cleaner per facility from the 50 gram per liter standard. There are no District emission records on the unpermitted units. The District's current emission inventory analysis is based on an ARB 1987 methodology utilizing statewide data. Emissions from area sources such as the parts washers are grouped into categories. Sources in the commercial solvent cleaning categories include automotive repair facilities. In the 2001 Ozone Plan Source Inventory Description, emissions from the commercial solvent cleaning category were estimated at 6 Tons/Day.

Summary of Proposal

Staff proposes the following amendments, effective June 1, 2003:

- Deletion of the limited exemption (section 8-16-121) for one single cold cleaner per facility with an annual solvent loss limit of 20 gallons per year.
- Deletion of the limited exemption (section 8-16-122) for permitted cold cleaners.
- Addition of definitions for repair and maintenance cleaning (section 8-16-233), automotive repair facility (section 8-16-234), aerospace components (section 8-16-235), electrical and electronic components (section 8-16-236), precision optics (section 8-16-237), and medical devices (section 8-16-238).
- Addition of an exemption (section 8-16-123) for specific cleaning operations.

- Addition of an exemption (section 8-16-124) for aqueous cleaning operations.
- Addition of a standard requiring that all facilities which perform repair and maintenance cleaning use cleaners with a VOC content no greater than 50 grams per liter (either aqueous or VMS-based solvents)
- Addition of recordkeeping requirements for approved emission control devices to record applicable key system operating parameters.
- Correction of minor deficiencies of the rule (identified by EPA[14]):
  i. correcting incorrect section references in 8-16-111, 8-16-602.2, and 8-16-602.3;
  ii. correcting inconsistent definition in section 8-16-214; and
  iii. increasing recordkeeping interval in section 8-16-501.2.
- Addition of standards to the limited exemption of section 8-16-115 to ensure good housekeeping and minimize solvent evaporation.

The revisions to the rule are being proposed for the following reasons:

- To implement Control Measure SS-14 from the Bay Area's 2001 Ozone Attainment Plan, Aqueous (Water-Based) Solvents, in order to reduce emissions of VOCs by the use of low VOC aqueous cleaners.
- To implement changes in technology (new cleaning materials and equipment).
- To clarify the specific applicability of the rule sections.

Emission Reductions

Staff estimates that there are approximately 6,000 repair and maintenance related businesses in the nine counties of the Bay Area, based on a search by SIC code. These facilities include automotive exhaust systems repair, tire retreading and repair, automotive glass replacement, automotive transmission repair, general automotive repair, motorcycle repair, and industrial truck repair.

Using Safety Kleen data[15], Staff estimates that there 7,900 solvent parts washers in the Bay Area used for repair and maintenance cleaning. Each of these parts washers emit an average of 0.6 lb/day of VOC[16]. The total emissions from cold cleaners in the Bay Area are estimated to be 2.37 tons per day (TPD) based on the following calculations:

(7,900 cold cleaners) (0.6 lbs/day) / (2000 lb/ton) = 2.37 TPD

The mineral spirits used in most cold cleaners average 6.7 lb/gal of volatile organic compounds (VOC). Replacement of this organic solvent with an aqueous cleaner at 50 g/l (0.42 lb./gal) would result in an emissions reduction of 2.2 TPD, based on the following calculations:

Equivalent emission reduction expressed as gallons of solvent emitted:
(2.37 TPD) (2000 lb/ton) (1 gal/6.7lb) = 707 gal/day

Emission reductions from solvent substitution:
(707 gal/day) (6.7 lb./gal. - 0.42 lb./gal) / (2000 lb/ton) = **2.2 TPD**

The total emission reduction for staff's proposal is the **2.2 TPD** emission reduction for solvent substitution at repair and maintenance facilities.

Cost of Control

General

The costs for most of the changes mandated by this rule revision are negligible except for the costs of switchover to aqueous systems.

For the switchover to aqueous cleaners, the costs for the Bay Area are based on information obtained from the SCAQMD staff report[17], the IRTA report[8], and supplemented by Bay Area market information. South Coast staff calculated a cost-effectiveness of -$582 per ton of VOC reduced. The negative number represents cost savings for the affected industry. The IRTA study also reports that the "use of the water-based cleaning systems is likely to be less costly overall than the use of mineral spirits."

Staff estimates that approximately 75 percent of the Bay Area shop operators use petroleum-based parts washers provided by a nationwide service provider. The service provider charges a fee for removing the spent solvent, replacing it with recycled solvent and hauling away the spent solvent for recycling. Typical cost for this "cradle to grave" rental service is approximately $1500 per year. The costs vary depending on the frequency of visits for bath changeout.

The following costs were reported by IRTA for a mineral spirits parts washer rented from a major supplier:

Table 1. Mineral Spirits Parts Washer[8]

Annualized Equipment Cost	N/A
Solvent Cost	N/A
Electricity	$240
Disposal	N/A
Service Charge	$1213
Total	**$1453**

Equipment costs are included in the service charge because the service provider usually owns the equipment. Solvent and disposal costs are also included in the service charge.

The costs of a comparable aqueous parts washer are:

Table 2. Aqueous Parts Washer[8]

Annualized Equipment Cost (0.163) ($1000)[a]	$163
Solvent Cost	$297
Electricity	$720
Disposal	$300
Total	**$1480**

The initial cost of the equipment is estimated to be $1000 annualized over a 10-year period (the assumed equipment lifetime) at 10 percent interest. Solvent costs generally average $297; $9/gal, at 3 changeouts per year using 33 gallons of concentrate per year. Waste disposal costs are $200 per drum, with a bath life of approximately 8 months or 1.5 times per year.

The following costs were supplied by a solvent cleaner and solvent supplier[18]:

Table 3. Solvent Unit (Operator owned)[9]

Annualized Equipment Cost	$236
Solvent Cost, ($10) (13.3 gal) ($10) (30 gal)	$133 (makeup) $300 (initial)
Electricity	$240
Cost of filters	$62
Disposal	$200
Total	**$1171**

[a] based upon a 10-year amortization period at an interest rate of 10%.

Cost of a new parts washer (35 gal.) is $1,450. Cost of solvent and filters is $195. The costs for disposal could not be calculated because the waste stream is usually commingled with the shop's oily waste stream. As the waste solvent has a similar profile as used motor oil, shops are paying the same price per gallon for disposal. According to the supplier, the initial solvent charge never needs changeout. Solvent is added to replace quantities lost to dragout and evaporation. Eventually, when the solvent becomes too contaminated with oil, it is pumped out of the tank into a holding tank. The waste residue is removed and the tank is cleaned. The used solvent is pumped back into the tank for filtering and reuse. (This process may occur after one or two years of use.) Cost-effectiveness calculations are estimated based on a "worst case" scenario of one waste shipment per year.

The design of the aqueous parts washer is virtually identical to a mineral spirits parts washer except that the unit is usually plastic or stainless steel. For heavy-duty applications, the preferred design is similar to a dishwasher, an enclosed spray cabinet.

Staff believe that most users who choose to comply by using aqueous systems will opt to dispense with a service provider in order to save costs. A nationally known supplier is willing to service aqueous systems but will charge 10 percent more than a comparable mineral spirits system. Costs for additional equipment are not included in the analysis: additional rinse stations, evaporator ($3000), oil skimmer ($200), hot air dryer, etc. Only the larger facilities would require such equipment.

In the IRTA study, costs of low use shops (light workload) and high use shops (heavy duty) were compared based on the observation that most shops tended to be either large or small rather than "middle of the road." Costs at low use shops using aqueous solutions were lower than comparable mineral spirits systems; the extended bath life and reduced disposal cost resulted in net savings for the operators.

A comparison of the high use shops also demonstrated net savings to the operators of aqueous systems. Two factors contributed to this result, labor costs and type of equipment. Labor costs were estimated to be higher for the mineral spirits parts washer versus the aqueous system. For heavy-duty applications, the recommended equipment type is a spray cabinet. These units are more expensive at $5000 to $8000. However, labor costs are reduced because the worker loads the unit and is free to perform other tasks rather than manually cleaning the part.

For those opting to use VMS, part washer suppliers, such as Safety Kleen, can perform the modifications to the part washers to enable the use of VMS.

Costs will determine the action of most operators. Facility operators will likely choose their equipment type based on regulatory requirements, worker exposure, ease of use, and individual preferences. Facilities attempting to minimize costs will focus on the factors that are most significant in contributing to

total cost: the initial equipment cost and bath life, and the interval between bath changeout.

Analysis of Staff Recommendation

Staff recommend that all repair and maintenance facilities be required to use only aqueous cleaners or methylated siloxanes (low volatility compounds with negligible volatility and no known significant toxicity) in their cold cleaners. Data show that aqueous cleaners are cost-effective and clean adequately for repair and maintenance operations. Methylated siloxanes are an alternative to the aqueous cleaners because of their negligible volatility. Because methylated siloxanes are non-precursor organic compounds, they have a volatile organic compound content of zero. Only a few facilities currently use siloxanes. Due to the high cost of siloxanes, staff predict that not many facilities will use this alternative. Several Bay Area facilities, however, have invested in VMS parts washers with enclosed washing systems to minimize the evaporation of the VMS. Staff have evaluated these and find that they result in equivalent VOC reductions with no likely environmental impact.

In analyzing the cost-effectiveness of this control strategy, the following assumptions were made:

1. 7,900 cold cleaners will switch to water-based cleaners.
2. Organic solvents average 6.7 lb of VOC per gal.
3. The inventory of affected cold cleaners in the Bay Area is 7,900 units.
4. Aqueous cleaners sold in concentrated form require a dilution of 4:1 (one gallon of concentrate plus 3 gallons of water to equal a 25% concentration by volume).
5. Solvent use averages 27.9 gallons/year/unit.

Table 4. Annual Cost of Compliance (Industry wide)

Equipment Replacement Cost (Solvent Cleaner) (5900) ($236)[10]	$1,392,400
Equipment Replacement Cost (Aqueous) (5900) ($163)[9]	$961,700
Operation Cost (Aqueous, Electricity) (5900) ($720)[9]	$4,248,000
Operation Cost (Solvent, Electricity) (5900) ($240)[10]	$1,416,000
Disposal (Aqueous) (5900) ($300)[9]	$1,770,000
Disposal (Solvent) (5900) ($200)[10]	$1,180,000
Organic Solvents (707 gal) ($10/gal) (312 days/yr)	$2,205,840
Aqueous Cleaners (707 gal) (.25) ($10/gal) (312 days/yr)	$551,460
Cost Difference in Waste Disposal	$590,000
Cost Difference in Operation Cost	$2,832,000
Cost Difference in Solvent Cost	-$1,654,380
Cost Difference in Equipment Replacement	-$430,700
Estimated Emissions Reductions 2.2 TPD(365 days/yr)	803 TPY
Estimated Cost-Effectiveness ($1,336,920)/803TPY	$1,664 /ton

An analysis of the cost for businesses to switch to new operations (cost-effectiveness) is a requirement under state law. The cost of compliance is identified as the cost per ton of VOC emissions reduced.

The total costs for solvent substitutions are:

Total cost = Equipment Cost Difference + Operation Cost Difference + Material Cost Difference + Disposal Cost Difference.

= $1,336,920 per year

Impacts

The socioeconomic impacts, incremental costs, environmental impacts, and regulatory impacts of the proposed amendments have been studied, and the results of these studies are included in this staff report.

Socioeconomic Impacts

A copy of the socioeconomic impact report is provided in the appendix of this staff report. The report finds no significant socioeconomic impact from the proposed amendments.

Incremental Costs

Health and Safety Code Section 40920.6 requires the District to (1) identify one or more control options achieving the emission reduction objectives for the proposed rule, (2) determine the cost effectiveness for each option, and (3) calculate the incremental cost effectiveness for each option. To determine incremental costs, the District must "calculate the difference in the dollar costs divided by the difference in the emission reduction potentials between each progressively more stringent potential control option as compared to the next less expensive control option."

A more stringent control for Rule 8-16-303.5 would be to reduce VOC emissions from cleaning activities on electrical, electronic components, high precision optics and all types of aerospace and military applications by removing the proposed exemptions and imposing a 50 gm/liter VOC limit (aqueous cleaner). At present, aqueous cleaners may not be technologically feasible for cleaning electrical/electronic apparatus or energized equipment such as electrical motors, generators, or transformers because of potential damage to electrical/electronic components due to short-circuiting and/or corrosion because of the presence of water in aqueous cleaners. Because the proposed provisions are considered to be the only technologically feasible option available at this time, an incremental cost effectiveness analysis for Rule 8-16-303.5 is not appropriate.

Environmental Impacts

Pursuant to the California Environmental Quality Act (Public Resources Code Section 21000 et seq.), an initial study for the proposed amendments to Regulation 8, Rule 16 was conducted by the District's CEQA consultant, Jones & Stokes. The study concluded that the proposed amendments would not have significant environmental impacts. A Negative Declaration is proposed for adoption by the Board.

Regulatory Impacts

Section 40727.2 of the California Health and Safety Code requires an air district, in adopting, amending, or repealing an air district regulation, to identify existing federal and district air pollution control requirements for the equipment or source type affected by the proposed change in district rules. The district must then note any differences between these existing requirements and the requirements imposed by the proposed change. Where the district proposal does not impose a new standard, make an existing standard more stringent, or impose new or more stringent administrative requirements, the district may simply note this fact and dispense with the analysis otherwise required by this law.

The proposed amendments to Regulation 8, Rule 16 do impose additional requirements for repair and maintenance solvent cleaning operations. The 50 grams per liter VOC standard is the major revision to the rule. The remaining amendments do not impose more stringent requirements and are therefore exempt from analysis under Section 40727.2. There are no comparable federal or district standards for solvent cleaning operations. Accordingly, the district simply notes that no other federal or district standards apply.

Conclusion

Since the EPA has redesignated the Bay Area as an ozone nonattainment area, the District must achieve new emission reductions. This measure presents an opportunity for a significant reduction in a single source category. The proposed revisions to Regulation 8, Rule 16, Solvent Cleaning Operations, will clarify existing language and will partially satisfy the requirement in the Clean Air Plan for adoption of control measure SS-14.

Pursuant to California Health and Safety Code Section 40727, regulatory amendments must meet findings of necessity, authority, clarity, consistency, non-duplication, and reference. The proposed amendments are:

- Necessary to limit emissions of volatile organic compounds, a primary precursor to urban ozone formation;
- Authorized by Sections 40000, 40001, 40702, and 40725 through 40728 of the California Health and Safety Code;
- Written or displayed so that its meaning can be easily understood by the persons directly affected by it;
- Consistent with other District rules, and not in conflict with state or federal law;
- Non-duplicative of other statutes, rules, or regulations; and
- Are implementing, interpreting, or making specific the provisions of California Health and Safety Code Sections 40000 and 40702.

Comments and Responses

1. **SKC America** (May 29, 2002 E-mail)

   Comment: Ducting a closed solvent sink with solvent exceeding 50 g/l to an emission control device should be a complying alternative under 8-16-303.5.

   Response: Provisions to Regulation 8-16-303.5 were added to allow the use of abatement equipment to comply with Regulation 8-16-303.5 requirements.

2. **New United Motor Manufacturing Inc.** (June 14, 2002 E-mail)

   Comment #1: Regulation 8-16-123 should be amended as follows:

   > **8-16-123 Limited Exemption, Specific Cleaning Operations**: Effective January 1, 2003, Regulation 8-16-303.5 shall not apply for the cleaning of electrical components, medical devices, or equipment, components, and parts used in the manufacturing of products and goods.

   Response #1: Staff disagrees that the term "equipment, components, and parts used in the manufacturing of products and goods" should be exempt from Regulation 8-1-6-303.5. Cleaning of the equipment, components, and parts involved in the manufacturing process are subject to the rule if such equipment, components, and parts are part of the production line and cleaning of such equipment, components, and parts provides maintenance cleaning to the production line itself. The term "equipment, components, and parts" is vague and does not add clarity to the rule. As a result, Staff did not incorporate NUMMI's recommendation.

   Comment #2: Regulation 8-16-124 should be amended as follows:

   > **8-16-124 Limited Exemption, Surface Coating Operations**: Effective January 1, 2003, Regulation 8-1-6-303.5 shall not apply for the cleaning of surface coating application equipment if the coating operations are subject to other rules in this regulation.

   Response #2: Regulation 8-16-303.5 is intended to apply to any cleaning of surface coating application equipment if the cleaning is performed in a cold cleaner. Spray gun washers have been added to the list of specific cleaning operations, which are exempt from 8-16-303.5, per Regulation 8-16-123. Wipe cleaning and surface preparation are either subject to Regulation 8-4 or other applicable coating operation rules. As a result, Staff did not incorporate NUMMI's recommendation.

3. **Graniterock** (June 17, 2002 E-mail)

   Comment: Graniterock operates several facilities in the District. In order to adequately research and properly implement complying solvent, the effective date of the proposed amendments should be changed from January 1, 2003 to January 1, 2004.

   Response: Nine months is more than adequate for Graniterock and other affected facilities to comply with the proposed amendments, the compliance date has been changed to June 1, 2003.

4. **NORA** (formerly the National Oil Recyclers Association, now known by the acronym only) (June 18, 2002 E-mail)

   Comment #1: NORA was founded in 1984 and currently represents approximately 200 companies throughout the United States that collect and recycle used oil, antifreeze, wastewater, oil filters and parts cleaners. These firms collectively service approximately 90% of the parts cleaners in the United States, and between 85% and 90% of those in the Bay Area.

   The rulemaking fails to take into account the fact that low volatility mineral spirits solvents with no aromatic content have minimal ozone reactivity, and thus banning these solvents will have no substantial effect on reducing ozone levels, the ultimate objective of VOC reduction.

   Response #1: At this time, mineral spirits do not appear to be less reactive.

   Comment #2: We are particularly concerned about the deletion of the limited exemption for one single cold cleaner per facility (section 8-16-121). The single unit exemption is a much preferred rule model. It minimizes the cost impact on small and minority business that cannot afford the spray cabinet or ultrasonic aqueous units that make aqueous cleaning labor cost effective. It recognizes that aqueous solvents do not work in all applications.

   Response #2: Staff analyzed the impact on local businesses in the District and found that using aqueous type cleaners will result in a net cost savings for these businesses. Staff understands that the proposed regulations may impact waste recyclers, but does not expect the impact to be significant since spent aqueous cleaners usually have to be disposed of in the same manner as spent cleanup solvents.

   Comment #3: As the members of the Hydrocarbon Solvents Panel of the American Chemistry Council will attest, aromatics-free mineral spirits with

very little ozone reactivity is readily available to NORA Parts Cleaning Council members. The recognized expert in this field, Dr. William Carter, has tested several of these solvents in environmental chamber experiments. This research clearly demonstrates that aromatics-free mineral spirits has very low ozone formation potential. [Reference: Carter, W. L. P., "Documentation of the SAPRAC-99 Chemical Mechanism for VOC Reactivity Assessment" Report to the California Air Resources Board, Contract 92-329 and 95-308, May 8, 2000] Dr. Carter is the leading proponent of reactivity-based ozone control strategies. All VOC's are not alike in their ozone formation potential. VOC controls that consider reactivity can be more effective that regulations that treat all VOC's equally. The California Air Resources Board has utilized Dr. Carter's MIR reactivity scale in several regulations. Recently, the California Consumer Products Regulation Relating to Aerosol Coating Products incorporated reactivity-based standards, and they are being considered for architectural coatings.

Response #3: Low reactivity based standards for aerosol products were used by CARB in their Consumer Product Regulations. Solvents with low levels of reactivity have lower potential to react in the atmosphere to form ozone. Staff are aware that the ARB has a current research contract with Dr. William Carter to conduct environmental chamber tests on various types of low reactivity solvents, including mineral spirits/distillates, to develop measurements for ozone formation potential of volatile organic compounds. So far Dr. Carter's research is not complete. Reliability and reproducibility of the test systems need to be improved before solvents can be accurately tested. Dr. Carter's research for Safety Kleen indicated that Type II-C mineral spirits had a maximum incremental reactivity (MIR) of approximately 0.8 grams ozone/gram VOC. The research also indicated that the MIR for Safety Kleen's Type I-B mineral spirits is approximately 1.3 grams ozone/gram VOC. (To provide some perspective, the MIR for acetone is 0.4, the MIR for isopropyl alcohol is 0.7, and the MIR for methyl ethyl ketone is 1.5). However, it may be incorrect to state that the research clearly demonstrated low ozone formation potential for mineral spirits in general. In his project report, Dr. Carter stated that, "…the representativeness of these four samples to the full range of mineral spirits or similar samples being subject to VOC regulations is highly uncertain. At this time, given the results from these studies, mineral spirits do not appear to be less reactive."

Comment #4: The mineral spirits referred to above also has very low volatility, less than 1 mm vapor pressure at ambient temperature. The use of very low volatility solvent significantly reduces the evaporation rate from parts cleaning activities. NORA members' data on parts cleaning with low volatility mineral spirits indicate that the emission rate of petroleum vapor from "sink-on-a-drum" parts cleaners is approximately one half of the amount assumed

in calculating the reduction of emissions from banning the use of mineral spirits for parts cleaning.

Response #4: Using low volatility solvents does reduce the rate of evaporation (loss) of these solvents compared to solvents with higher volatility. These low volatility solvents, however, eventually evaporate into the atmosphere. It may take more time to clean with low VOC cleaners, but not more low VOC cleaners to clean the same part.

Comment #5: NORA has offered to provide California Area Air Quality Management Districts with a list of Best Management Practices for the operation of “sink-on-a-drum” parts cleaners. Most of these practices are, however, already incorporated in the Bay Area Air Quality Management District rules. These practices include technical changes in the operation of “sink-on-a-drum” parts cleaners that can further reduce the emission of vapors of a minimally reactive hydrocarbon by another order of magnitude.

Response #5: NORA states that the use of Best Management Practice for the operation of "sink on drum" parts cleaner will result in reductions of VOC emissions. As NORA notes, however, Regulation 8-16 already includes requirements for such practice.

Comment #6: The calculation used by the California Air Quality Management Districts of emissions from cleaning repair parts with solvent in “sink-on-a- drum” parts cleaners is based on excessive estimates of not only the evaporation rate of the low volatility mineral spirits, but also the hours of operation of these units in typical automotive repair or, less often, in machinery repair. Because mineral spirits is a very efficient cleaner, only a few minutes are needed to actually wash the dirty part. With best management practices in force, the solvent stream is normally off and the sink acts as a cover over the quiescent solvent in the drum.

Fifth, NORA believes that observation and measurement of the actual operation of a number of remote reservoir “sink-on-a-drum” part cleaners in typical automotive and industrial service, using low volatility, low reactivity mineral spirits solvents that are now common, and under best management practices will provide a sound technical basis for regulation of solvent-based parts cleaning in the Bay Area. NORA members are eager to participate in such a well-designed test to measure the actual emissions from remote reservoir “sink-on-a-drum” parts cleaners, and to assist the Bay Area Air Quality Management District and/or CARB in answering their questions.

Response #6: Staff estimates of the overall VOC emission reductions from solvent usage in the District are not based on hours of operation. VOC

emission estimates from part cleaners are based on annual solvent usage and solvent loss data provided to the District. Staff therefore believe that VOC emission reduction estimates are not exaggerated.

Comment #7: In contrast to the conclusions of the IRTA study, small and minority businesses tell our members that water-based cleaners are often not as effective as mineral spirits, particularly with manual parts cleaning. Thus operators spend an inordinate amount of time to achieve adequate cleaning. When they cannot clean the parts adequately, they often resort to covert cleaning with gasoline or pre-cleaning with sprays. The cost savings attributed to potentially longer service intervals with aqueous cleaners also has not materialized. Change out frequency for aqueous is the same as for solvent units. Besides frustrating the purpose of SS-14, covert cleaning, spray cleaning with aerosols, higher labor costs, and higher electrical costs all increase the cost of maintenance to small businesses. Ultimately, all consumers would suffer economic harm if parts cannot be cleaned with mineral spirits if and when necessary.

Response #7: Staff analyzed the impact on local businesses in the District and found that using aqueous type cleaners will result in a net cost savings for these businesses.

5. **Vigobyte International** (June 18, 2002 E-mail)

Comment: Is a kettle cleaning enclosure subject to the proposed amendments to Regulation 8-16?

Response: Cleaning of the process equipment is considered maintenance cleaning.

6. **IBM Almaden Research Center** (June 26, 2002 E-mail)

Comment: Are vapor solvent dryers subject to the proposed amendments?

Response: Vapor solvent dryers are not subject to Regulation 8-16-303. They are subject to Regulation 8-16-301. As a result, the IPA vapor dryers used by IBM are not subject to 303.5.

7. **United Airlines** (June 25, 2002 Letter)

Comment: UAL performs a wide variety of aircraft repair and maintenance cleaning activities at the San Francisco Maintenance Center that are subject to Regulation 8-1. Most of the solvents that UAL use on aircraft components

are either specified by original equipment manufacturer (OEM) and/or must be tested to meet stringent corrosion requirements and shall be suitable or compatible with the chemicals stored or used in each component or assembly. Solvents used on aircraft components are specific for each component and material of construction. Water reducible cleaners are not suitable for sensitive assembled parts (specifically when magnesium and magnesium alloys are present) and complex configured parts, as water entrapped in faying surfaces will cause dissimilar metal corrosion or flash rusting. UAL has OEM documentation that specifically prohibits aqueous solution on these components due to corrosion and fluid contamination. UAL proposed amendments to Regulation 8-29 to update its provisions similar to the SCAQMD. If Regulation 8-29 is not amended, UAL recommended adding the following language to Regulation 8-16 to include a limited exemption for aerospace component cleaning operations along with a definition of aerospace components:

8-16-123 **Limited Exemption, Specific Cleaning Operations**: Effective June 1, 2003, Regulation 8-16-303.5 shall not apply for the cleaning of aerospace components, electrical components, and medical devices.

8-16-235 **Aerospace Component**: The fabricated part, assembly of parts or completed unit of any aircraft, helicopter, missile or space vehicle. For the purposes of this Rule, an aerospace component shall include any aerospace prototype or test model.

Response: Because the District is not proposing to amend Regulation 8-29 at this point in time, Staff has adopted UAL proposed language in the Regulation 8-16-123 to include aerospace components and Regulation 8-16-235 to include the definition.

8. New United Motor Manufacturing Inc. (June 27, 2002 Letter)

Comment # 1: NUMMI recommends that following change to Regulation 8-16-111, because wipe cleaning standards and record keeping requirements are specified under other Rules:

8-16-111 **Exemption, Wipe Cleaning**: The requirements of Section 8-16-301 through 304 of this Rule shall not apply to any solvent cleaning operation employing only wipe cleaning. ~~Wipe cleaning is subject to the requirements of Section 8-16-501.3.~~ Wipe cleaning operations are regulated under Regulation 8 Rule 4 and other Rules of Regulation 8.

Response #1: Not all wipe cleaning operations rules will be subject to Regulation 8, Rule 4 or other rules of Regulation 8. For example, the proposed amendments to Regulation 8, Rule 4 will exempt aerospace and research and development wipe cleaning operations from Regulation 8, Rule 4. NUMMI's proposed change would exempt all aerospace wipe-cleaning

operations from keeping records on the wipe cleaning usage, which is not the Staff's intention. As a result, Staff did not incorporate NUMMI's recommendation, however a proposed amendment to 8-16-111 clarifies that other Rules may regulate wipe cleaning activities.

Comment # 2: NUMMI recommends that proposed changes indicated in amendments to Regulations 8-16-122 take effect on June 1, 2003 or later because the vendors at the workshop indicated that they could not supply the volume of cold cleaners necessary to meet the January 1, 2003 deadline. June 2003 is the start of the smog season.

Response # 2: Effective date has been changed to June 1, 2003.

Comment #3: NUMMI recommends that Regulation 8-16-122 be amended to allow that if a person operates a cold cleaner in compliance with section 8-16-303.4.4, then the source is exempted from the requirements of section 8-16-303.5.

Response #3: Provisions to Regulation 8-16-303.5 were added to allow the use of abatement equipment to comply with Regulation 8-16-303.5 requirements.

Comment #4: 8-16-303.5 should not apply to surface coating operations and equipment, because surface coating and surface preparations are covered by other District regulations.

Response #4: Wipe cleaning operations used in surface coating operations are currently and will continue to be exempt from the Regulation 8-16-303.5. Spray gun washers will also be exempt from Regulation 8-16-303.5 per Regulation 8-16-123.

Comment #5: Sources subject to Regulation 8-16-303.5 should not have to comply with District Regulations 501.1, 501.2, 501.3, 501.4, 501.5 and 501.6.

Response #5: Proposed regulation 8-16-124 specifically exempts water-based cleaners that comply with Regulation 8-16-303.5 from the record keeping requirements of Regulation 8-16-501. Note, however, that such owner/operators of sources must comply with Regulation 8-16-502.

Comment #6: Regulation 8-16-303.5 should not apply to the cleaning of any electrical component, electronic apparatus or medical device as defined by 8-

16-234, 8-16-235 or 8-16-236. NUMMI also recommended definitions for these categories.

Response #6: Regulation 8-16-303.5 has been amended to include reference to electronic apparatus. Electronic component and medical device were already exempt under Regulation 8-16-123. In addition, the suggested definitions were added in Regulation 8-16-236.

Comment # 7: The VOC requirement of 8-16-303.5 should not apply to any source operation that is subject to or specifically exempted by any of the other District regulations or an EPA approved version of the applicable listed rule.

Response #7: Regulation 8-16-303.5 applies to all cold cleaner sources, unless the cold cleaner is exempt per proposed Regulation 8-16-123. Also see response to Comment # 1.

9. Goodrich Corporation (June 28, 2002 Email)

Comment: Regulation 8-16-123 should be amended to include reference to aircraft in addition to aerospace.

Response: The definition of aerospace in Regulation 8-16-235 includes aircraft.

10. Safety Kleen Systems (July 1, 2002 Email)

Comment # 1: The rule does not allow exempt solvents. There may be valid reasons why the District does not want to allow some exempt solvents. The rationale for excluding these solvents should be presented and discussed. The failure to allow exempt solvents places an unfair burden on the businesses in the San Francisco Bay Area without an appreciable gain in environmental protection. This burden has not been placed on businesses in the other Air Districts that have adopted <50g /l VOC solvent cleaning rules.

Response # 1: Staff does not recommend exempting any VOC from Regulation 8, Rule 16. Rule 16 regulates containerized solvent cleaning, an exemption from the rule would allow that solvents to be stored in open containers, or handled in a manner that produces significant emissions, ignoring even simple housekeeping steps such as storage in closed containers. Most solvents that the EPA has exempted, like acetone, produce some ozone, and at high evaporation rates have the potential to produce more ozone than some non-exempt but less evaporative solvents. This proposal allows compliance with the standards by the use of VMS. This is

different from an exemption because the user of this material still has to store it in closed containers, repair liquid leaks, keep usage records and set parts so the solvent drains back into the container. There are several Bay Area facilities that have invested in VMS parts washers that have enclosed washing systems to minimize the evaporation of the VMS. Staff have evaluated these and find them an acceptable alternative. Regulation 8-16-303.5 has been amended to allow the use of VMS.

Comment # 2: An implementation date that is approximately 3 months after the rule is finalized places a huge burden on the businesses in the Bay Area. A business's choice of cleaning option is a large financial and operational decision especially for small businesses. Additionally, the magnitude of the change in the Bay Area is significant enough to cause equipment availability issues. This situation is complicated by the fact that two other air districts have adopted similar rules and the process of conversion is currently underway. What the Bay Area business community wants is the same lead-time that other districts have afforded their affected businesses.

Response #2: Effective date has been changed to June 1, 2003.

11. Lawrence Livermore National Laboratory (July 1, 2003 E-mail)

Comment: The definition of "repair and maintenance" is broadly defined so that it would include the repair and maintenance of some materials used for scientific research and development. LLNL conducts research involving stringent cleanliness requirements, some of which involves repair/maintenance, and some of which has limited cleaning chemistry options. We use aqueous cleaning methods whenever possible, however, the proposed rule would prevent the option of using a solvent bath for repair/maintenance of research components, when necessary. For example, the proposed rule could impact the use of the KDP Forward System for optics cleaning in B391, and the optics processing operation in B432, and, the cleaning of the B581 "line-replaceable units." We recommend that the limited exemption in proposed Regulation 8-16-123 be amended to include "laboratory research and development," similar to the proposed exemption for electronics components and medical devices.

Response: Cleaning operations related to precision optics and research and development activities have been exempted from Regulation 8-16-303.5 per Regulation 8-16-123.

12. Travis Air Force Base (July 3, 2002 Letter)

Comment: Military aircraft and support maintenance and repair operations, with specific military specifications and/or Technical Orders, should be exempt from the proposed Regulation 8-16-303.5, that limits solvent to water based solvent not to exceed 50 g/l of VOC. Water based solvents do not meet the military specification and Technical Order for military aircraft maintenance and repair operations and may cause significant damage to equipment and endanger personnel or the military mission.
Military aircraft maintenance and repair operations include but are not limited to:

1. Engine maintenance and repair operations
2. Hydraulic system maintenance and repair operations
3. Break and wheel bearing operations
4. Wheel cleaning
5. Aircraft exterior washing operations
6. Aircraft surface preparation and coating operations
7. Fiberglass operations
8. Aircraft fuel cell/tank repairs
9. Survival equipment repairs

Response: An aerospace exemption and definition has been added to Regulation 8-16 to exempt cleaning of aerospace components from Regulation 8-16-303.5.

13. ChevronTexaco (July 3, 2002 Letter)

Comment: Chevron suggests the following exemption:

> **8-16-xxx** **Exemption, Laboratory Analytical Testing Procedures**: The Cold Cleaner Requirements specified in subsection 8-16-303.2 through 8-16-303.5 of this Rule shall not apply to the cleaning of laboratory analytical testing equipment with the specific solvents prescribed in analytical testing protocols published by the American Society of Testing ("ASTM"), the Federal Environmental Protection Agency ("EPA"), or other Federal agencies.

Response: The suggested change would relax the requirements of Regulation 8-16-303. An exemption has been added for research and development operations, performance testing to determine coating, ink or adhesive performance, and quality control and quality assurance testing.

14. Northrop Grumman (July 20, 2002 E-mail)

Comment: Northrop Grumman Marine Systems requested that an exemption be added for Marine Vessel and Military Weapons Systems Components. Some of the permitted cold cleaners that Northrop has are used to clean manufactured products, hence part of the process and exempt from the 50

g/l VOC limit, and some are for the cleaning of tools, machinery, or equipment, hence possibly subject to the repair and maintenance requirement. The facility does have three-permitted cold cleaners in their shipping and receiving department that are classified as finger print removers and require the use of solvents per MIL-STD 2073.

Response: The fingerprint removal process is for the production of Northrop products and not for repair and maintenance. As a result, Regulation 8-16-303.5 does not apply.

15. Sandia National Laboratory (July 11, 2002 E-mail)

Comment #1: The Aerospace Components definition (8-16-235) should include the discreet components that make up a loaded assembly - which in turn becomes a "part". We suggest adding "/component" to the first part of the first sentence, so as to read: "The fabricated part/component, assembly of parts or completed unit of any aircraft, helicopter, missile or space vehicle."

Response #1: Staff has made the aerospace definition identical to that found in Regulation 8-29.

Comment # 2: The electrical components exemption (8-16-123) and/or the Electrical Components definition (8-16-236). The definition should include both the individual components, as well as the assemblies, which are loaded with components. Both may require pre-cleaning before assembly and post-cleaning after the assembly operations. The cleaning of electrical components should be construed to include cleaning of not only individual components/devices but also the assemblies, such as printed wiring boards loaded with numerous small components, both surface and through hole mounted, small electrical assemblies, cable harness terminations such as connectors, terminals or plugs, and the necessary cleaning after repair of such assemblies/components.

Response #2: Staff have revised the electrical components definition and combined it with electrical assembly in Regulation 8-16-236.

16. Pacific Gas & Electric (July 15, 2002 Letter)

Comment #1: The definition of Volatile Organic Compounds (VOC) in the proposed Regulation 8 Rule 16 (8-16-229) should be the same as that found in the May 20, 2002 draft of Regulation 8 Rule 4 (8-4-214) as follows:

> **8-4-214** **Volatile Organic Compound (VOC)**: Any organic compound of carbon (excluding methane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates and ammonium carbonate) which would be emitted during use of a solvent or other material.
>
> 214.1 For purposes of calculating VOC content of a coating, any water or any of the following non-precursor organic compounds: acetone methyl acetate parachlorobenzotrifluoride (PCBTF), cyclic, branched or linear, completely methylated siloxanes (VMS), shall not be considered part of the coating.
>
> 214.2 For the purposes of calculating the VOC content of cleanup and surface preparation solvent, any water or the following non-precursor organic compounds: acetone methyl acetate parachlorobenzotrifluoride (PCBTF), cyclic, branched or linear, completely methylated siloxanes (VMS) shall not be considered a part of the VOC content of the solvent but shall be considered part of the volume of the solvent.

Should the BAAQMD not make this change to the proposed regulation, then PG&E requests that the implementation be delayed until at least the beginning of the 2004 ozone season.

Response #1: Regulation 8-16-303.5 has been amended to allow the use of siloxanes. As for allowing option of paying into a "clean air" fund instead of complying with Regulation 8-16-303.5, staff has determined that such an allowance is not allowed in the current District regulations. In addition, staff is doubtful that the Federal Environmental Protection Agency would allow such a trading program.

Comment #2: Given the unfortunate reality that approximately 70% of the Bay's air pollution comes from mobile sources, PG&E requests that BAAQMD consider the scenario that stationary sources faced with new potentially expensive regulations have the option of paying into a "clean air." fund. The fund is used to convert "dirty" mobile sources into clean ones potentially via some form of stationary/mobile source emission trading credit program. This scenario or some derivative may be more cost effective for all parties involved and simultaneously accomplish the Districts goals in a timelier manner.

Response #2: The proposal of a "clean air" fund is a concept that requires more research. This rulemaking is not an appropriate vehicle for this concept. The commenter may want to contact the District's Advisory Council with their suggestion.

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[17] South Coast Air Quality Management District, Staff Report, To Amend Rule 1171 - Solvent Cleaning Operations, September 13, 1996.
[18] Chancellor, Bob, Telephone communication, Zep Manufacturing Co, July 1977.